

thereto, will best be appreciated in conjunction with the accompanying drawings, wherein like reference numerals denote like elements and parts, in which:

**[0060]** FIGS. 1A and 1B are schematic illustrations used to describe operations/techniques for controlling a window frame using one finger in accordance with a first embodiment of the present invention;

**[0061]** FIGS. 2A and 2B are schematic illustrations used to describe operations for controlling a window frame using two fingers in accordance with the first embodiment of the present invention;

**[0062]** FIGS. 3A to 3F are schematic illustrations used to describe operations for controlling a window frame using three fingers in accordance with the first embodiment of the present invention;

**[0063]** FIGS. 4A and 4B are schematic illustrations used to describe operations for controlling a window frame in accordance with a second embodiment of the present invention;

**[0064]** FIGS. 5A to 5C are schematic illustrations used to describe operations for controlling a window frame with fingers contacting opposite edges of the window frame in accordance with a third embodiment of the present invention;

**[0065]** FIGS. 6A and 6B are schematic illustrations used to describe operations for controlling a window frame with fingers contacting adjacent edges of the window frame in accordance with the third embodiment of the present invention;

**[0066]** FIGS. 7A to 7C are schematic illustrations used to describe operations for controlling a window frame with fingers contacting the same edge of the window frame in accordance with the third embodiment of the present invention;

**[0067]** FIGS. 8A to 8C are schematic illustrations used to describe operations for controlling a window frame in accordance with a fourth embodiment of the present invention;

**[0068]** FIGS. 9A to 9C are schematic illustrations used to describe additional operations for controlling a window frame in accordance with the fourth embodiment of the present invention, in which the window frame and content therein are locked;

**[0069]** FIGS. 10A and 10B are schematic illustrations used to describe operations for controlling a window frame in accordance with a variation of the fourth embodiment of the present invention;

**[0070]** FIGS. 11A to 11C are schematic illustrations used to describe operations for controlling a window frame in accordance with another variation of the fourth embodiment of the present invention;

**[0071]** FIGS. 12A and 12B are schematic illustrations used to describe operations for controlling multiple, independent window frames in accordance with the present invention;

**[0072]** FIGS. 13A to 13C are schematic illustrations used to describe operations for controlling multiple, common display window frames in accordance with the present invention;

**[0073]** FIGS. 14A to 14C are schematic illustrations used to describe operations for controlling multiple, common display window frames in accordance with further embodiments of the present invention;

**[0074]** FIGS. 15A to 15E are schematic illustrations used to describe operations for controlling multiple, common display window frames in accordance with additional embodiments of the present invention; and

**[0075]** FIG. 16 is a block diagram of a system including a display device and a controller for carrying out the various operations and techniques of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

**[0076]** The present invention pertains to techniques for interfacing with multi-input devices, including multi-input displays, multi-touch displays/screens, multi-input capable touch tablets, multi-input devices that receive inputs via one or more fingers of a user and/or via one or more styluses or other mechanical, electro-mechanic, magnetic, etc., devices, and any other device or apparatus capable of sensing simultaneous multiple inputs. The multi-input displays/screens may be in the form of a computer monitor, a television, a telephone display, a personal digital assistant, and other such devices, whether portable or stationary. Moreover, multiple devices, such as two or more computer monitors, may operate together to display collectively an image or images to a user or users and, thus, the multi-input displays/screens may entail multiple devices/systems. As used herein, the terms “multi-input device” or “multi-input display device” (or, for convenience herein, “display device” or “input device”) are interchangeably used herein and shall refer to any of the above-mentioned devices including multiple units thereof or combinations of such devices. In addition, for convenience, the present invention is described in connection with an input device or display device receiving one or more inputs in the form of a user’s finger or fingers contacting the input device. It is appreciated, however, that other forms of inputs may be employed, such as via a stylus as mentioned above. Accordingly, the terms “finger” and “element” are interchangeably used herein to refer to any item (i.e., element) contacting the display device in accordance with the present invention.

**[0077]** The present invention pertains, in particular, to a user interface windowing system. As further described below and with particular reference to the drawing figures, the present invention provides various techniques for controlling, including moving, sizing, orientating, among other things, one or more windows in which an image or images are displayed. As discussed and shown in the various embodiments set forth herein, the window corresponds to a window frame through which (or in which) an image is provided and wherein parts of the image that extend beyond the window frame are not displayed. As described in detail below, the present invention is a user interface for controlling the windowing (or window framing) of images.

**[0078]** Multi-Touch Enabled Rectilinear Window Frame Style 1

**[0079]** FIGS. 1A-1B, 2A-2B, and 3A-3C schematically describe a first embodiment for controlling a window frame by employing both single and multi-touch techniques as herein described. For convenience only, the first embodiment is referred to herein as window frame style 1. In accordance with the present invention, window frame style 1 operates in different manners depending on the number of contact points (e.g., number of user fingers employed), the relative positions of those contacts and the relative movement of those contact points.

**[0080]** FIG. 1A of the drawings shows a display device 10 that displays an image of a window 12 (also called “window frame”) in which an image 14 (sometimes referred to herein as a “picture”) is provided. Conceptually, picture 14 extends beyond window 12, but only that portion disposed within window 12 is displayed. Window frame style 1 includes con-